

**Meeting of the Central Valley Flood Protection Board  
July 22, 2011**

**Staff Report – Encroachment Permit**

**Sutter Mutual Water Company  
Portuguese Bend Fish Screen, Sutter County**

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**1.0 – ITEM**

Consider approval of Permit No. 18660 (Attachment B)

**2.0 – APPLICANT**

Sutter Mutual Water Company

**3.0 – LOCATION**

The project is located on the left bank of the Sacramento River at river mile 88.2 within Reclamation District 1500, Unit No. 1 at Levee Mile 4.01, Sutter County, California. See Attachment(s) A-1thru-3

**4.0 – DESCRIPTION**

To install a state-of-the-art, self cleaning, and retractable Intake Screens, Inc. fish screen system on an existing agricultural diversion (Board Permit 3956) owned and operated by Sutter Mutual Water Company. See Attachment(s) C-1 thru-3

**5.0 – PROJECT ANALYSIS**

The installation of the retractable, self cleaning fish screens are an effort to minimize incidental take of juvenile salmon and steelhead during their migration downstream to the Pacific Ocean.

## **5.1 – HYDRAULIC ANALYSIS**

A hydraulic impact report was provided by the applicant showing negligible impact to flows within the floodway. See Attachment(s) D-1

## **5.2 – GEOTECHNICAL ANALYSIS**

The project as proposed will mainly utilize existing pilings and structures permitted under Board Permit 3956 and therefore a geotechnical analysis is not pertinent.

## **6.0 – AGENCY COMMENTS AND ENDORSEMENTS**

- Reclamation District 1500, the maintaining agency has provided an endorsement. See Attachment(s) E-1
- The U. S. Army Corps of Engineers 208.10 comment letter has not yet been received for this application. Upon receipt of a favorable letter and review by Board staff the letter will be incorporated into the permit as Exhibit A.

## **7.0 – CEQA ANALYSIS**

Board staff has prepared the following CEQA Findings:

The Board, acting as the CEQA lead agency, has determined that the project is categorically exempt from CEQA under a Class 1 Categorical Exemption (CEQA Guidelines Section 15301) covering minor alteration of existing public or private structures involving negligible or no expansion of use.

## **8.0 – SECTION 8610.5 CONSIDERATIONS**

1. Evidence that the Board admits into its record from any party, State or local public agency, or nongovernmental organization with expertise in flood or flood plain management:

The Board will make its decision based on the evidence in the permit application and attachments, this staff report, and any other evidence presented by any individual or group.

- 2. The best available science that related to the scientific issues presented by the executive officer, legal counsel, the Department or other parties that raise credible scientific issues.

The accepted industry standards for the work proposed under this permit as regulated by Title 23 have been applied to the review of this permit.

- 3. Effects of the decision on the entire State Plan of Flood Control:

The proposed project will have no adverse effects on the State Plan of Flood Control.

- 4. Effects of reasonable projected future events, including, but not limited to, changes in hydrology, climate, and development within the applicable watershed:

Future changes in hydrology caused by climate change could result in the need to remove and redesign the project if precipitation and water levels raise necessitating floodway boundary modifications.

**9.0 – STAFF RECOMMENDATION**

Staff recommends that the Board determine the project be exempt from CEQA, approve Permit No. 18660 conditioned upon receipt of a USACE 208.10 letter of determination confirming that the Corps has no objection to the project, and direct the Executive Officer to take the necessary actions to execute the permit.

**10.0 – LIST OF ATTACHMENTS**

- A. Location Maps and Photos
- B. Draft Permit No. 18660
- C. Design Drawings
- D. Hydraulic Analysis
- E. District Endorsement

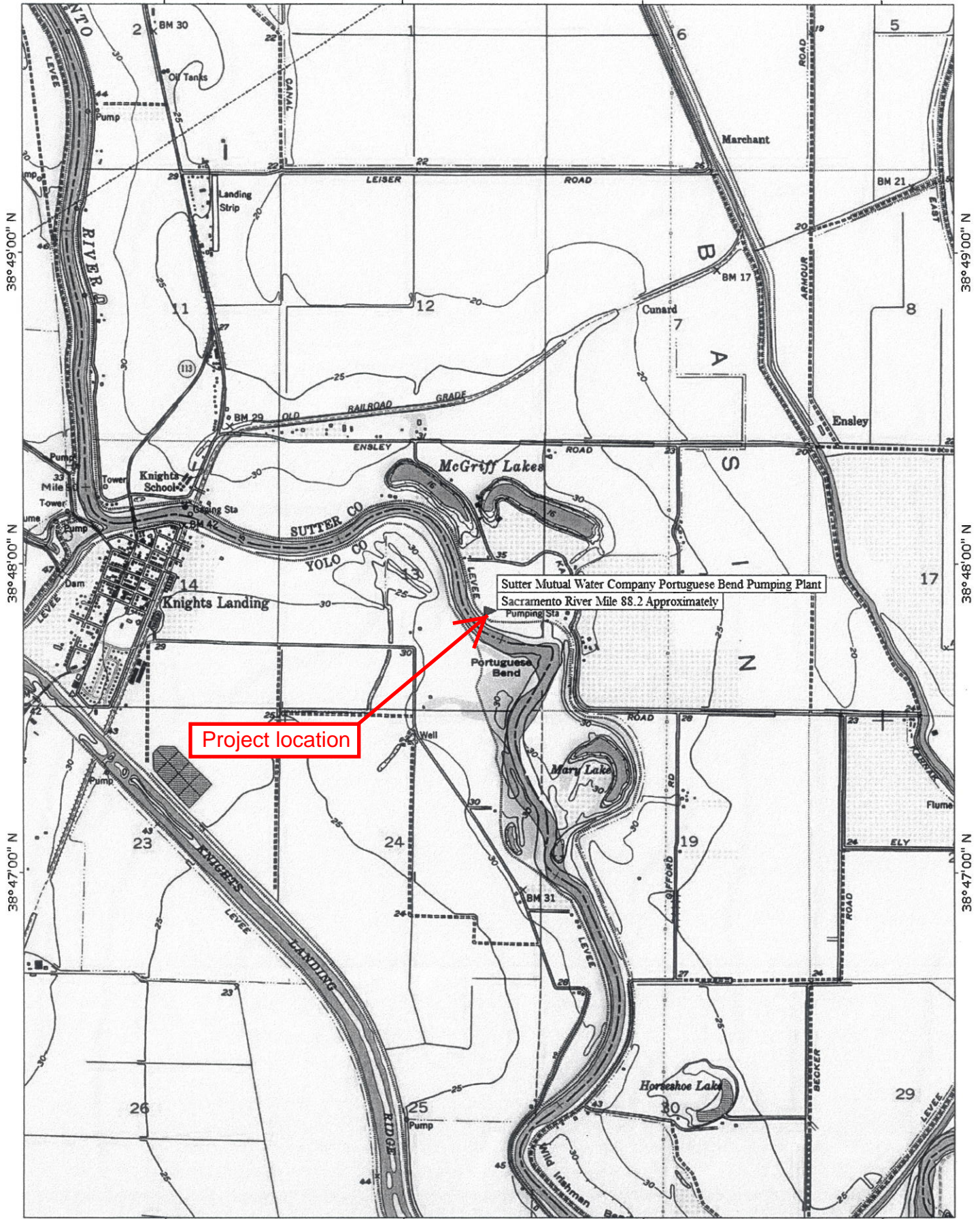
Design Review:	Sterling Sorenson
Environmental Review:	James Herota and Andrea Mauro
Document Review:	Mitra Emami P.E., Len Marino P.E.

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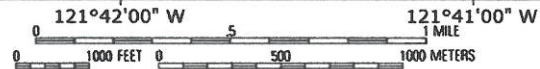
TOPO! map printed on 01/11/11 from "Sutter Mutual PB.tpo" and "Untitled.tpg"  
121°43'00" W 121°42'00" W 121°41'00" W

NAD27 121°40'00" W



Project location

Sutter Mutual Water Company Portuguese Bend Pumping Plant  
Sacramento River Mile 88.2 Approximately  
Pumping Sta #



Printed from TOPO! ©2001 National Geographic Holdings (www.topo.com)



Sutter Mutual Water Company \_ Project No. Y02-01

Portuguese Bend Site Pictures





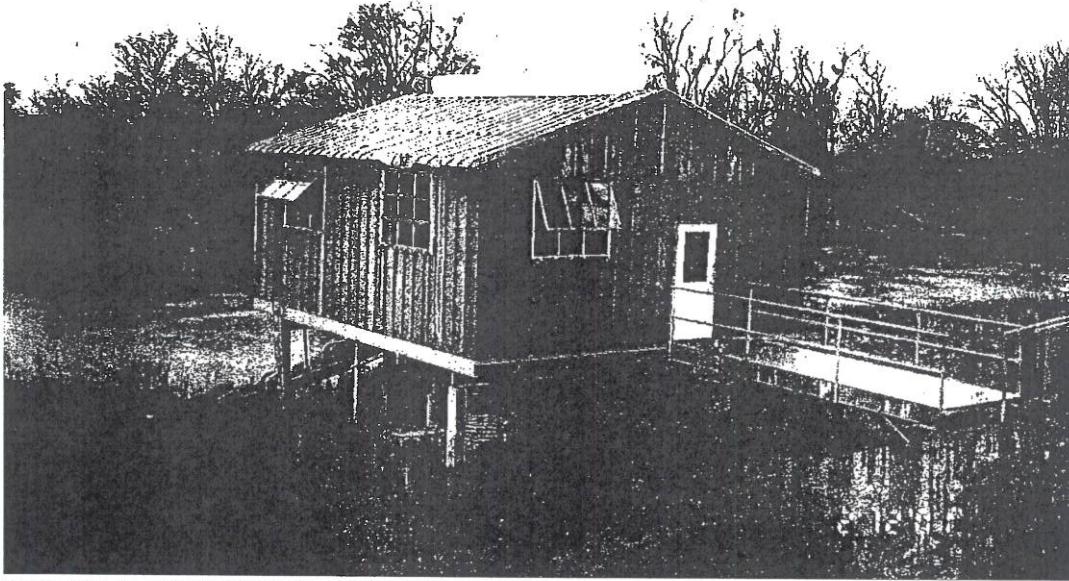


PHOTO NO.10: PORTUGUESE BEND PUMPING PLANT FACING UPSTREAM (2/12/01)

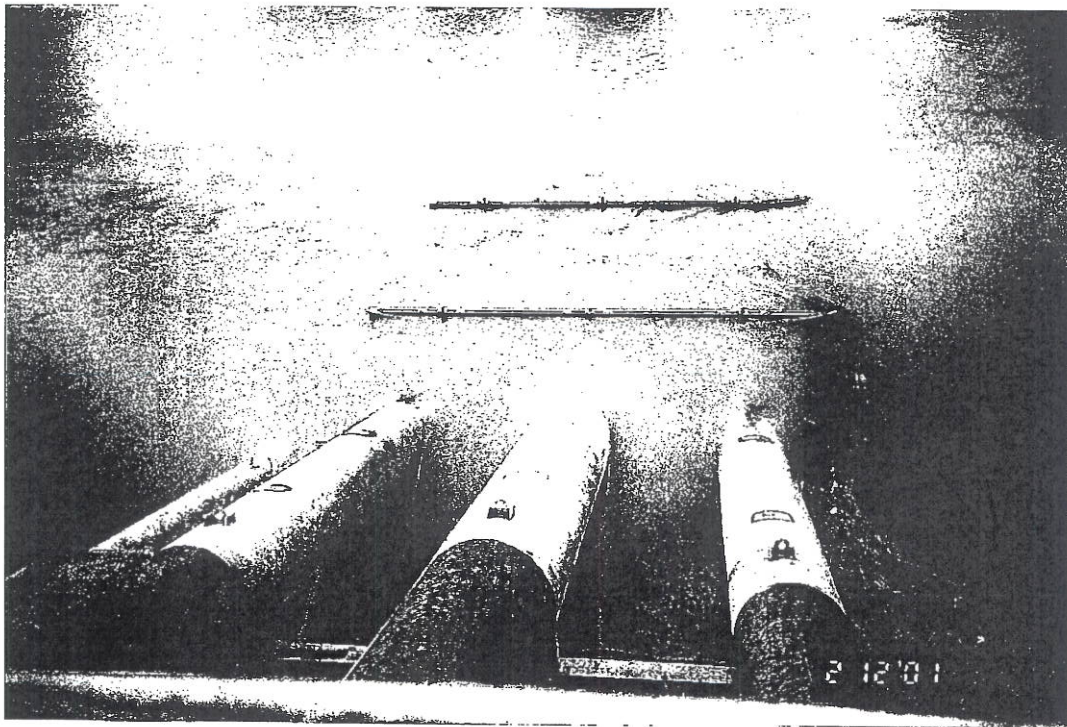


PHOTO NO.11: PORTUGUESE BEND PUMPING PLANT INTAKES (2/12/01)

**PHOTOS 10 AND 11**  
SUTTER MUTUAL WATER COMPANY  
TISDALE POSITIVE BARRIER FISH SCREEN FEASIBILITY STUDY  
**CH2MHILL**

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**DRAFT**

STATE OF CALIFORNIA  
THE RESOURCES AGENCY  
**THE CENTRAL VALLEY FLOOD PROTECTION BOARD**

**PERMIT NO. 18660 GM**

**This Permit is issued to:**

Sutter Mutual Water Company  
P.O. Box 128  
Robbins, California 95676

To install a self-cleaning, retractable fish screen system on an existing agricultural diversion (Board Permit 3956) owned and operated by Sutter Mutual Water Company. The identifier for the site is Project No. Y02-01, Sutter Mutual Water Company Portuguese Bend Pumping Plant. This diversion is located on the east bank of the Sacramento River at approximate river mile 88.2. On the east bank of the Sacramento River at approximate river mile 88.2 (Section 13, T11N, R2E, W, Reclamation District 1500, Sacramento River, Sutter County).

**NOTE:** Special Conditions have been incorporated herein which may place limitations on and/or require modification of your proposed project as described above.

(SEAL)

Dated: \_\_\_\_\_

\_\_\_\_\_  
Executive Officer

**GENERAL CONDITIONS:**

**ONE:** This permit is issued under the provisions of Sections 8700 – 8723 of the Water Code.

**TWO:** Only work described in the subject application is authorized hereby.

**THREE:** This permit does not grant a right to use or construct works on land owned by the Sacramento and San Joaquin Drainage District or on any other land.

**FOUR:** The approved work shall be accomplished under the direction and supervision of the State Department of Water Resources, and the permittee shall conform to all requirements of the Department and The Central Valley Flood Protection Board.

**FIVE:** Unless the work herein contemplated shall have been commenced within one year after issuance of this permit, the Board reserves the right to change any conditions in this permit as may be consistent with current flood control standards and policies of The Central Valley Flood Protection

Board.

**SIX:** This permit shall remain in effect until revoked. In the event any conditions in this permit are not complied with, it may be revoked on 15 days' notice.

**SEVEN:** It is understood and agreed to by the permittee that the start of any work under this permit shall constitute an acceptance of the conditions in this permit and an agreement to perform work in accordance therewith.

**EIGHT:** This permit does not establish any precedent with respect to any other application received by The Central Valley Flood Protection Board.

**NINE:** The permittee shall, when required by law, secure the written order or consent from all other public agencies having jurisdiction.

**TEN:** The permittee is responsible for all personal liability and property damage which may arise out of failure on the permittee's part to perform the obligations under this permit. If any claim of liability is made against the State of California, or any departments thereof, the United States of America, a local district or other maintaining agencies and the officers, agents or employees thereof, the permittee shall defend and shall hold each of them harmless from each claim.

**ELEVEN:** The permittee shall exercise reasonable care to operate and maintain any work authorized herein to preclude injury to or damage to any works necessary to any plan of flood control adopted by the Board or the Legislature, or interfere with the successful execution, functioning or operation of any plan of flood control adopted by the Board or the Legislature.

**TWELVE:** Should any of the work not conform to the conditions of this permit, the permittee, upon order of The Central Valley Flood Protection Board, shall in the manner prescribed by the Board be responsible for the cost and expense to remove, alter, relocate, or reconstruct all or any part of the work herein approved.

#### **SPECIAL CONDITIONS FOR PERMIT NO. 18660 GM**

**THIRTEEN:** All work approved by this permit shall be in accordance with the submitted drawings and specifications except as modified by special permit conditions herein. No further work, other than that approved by this permit, shall be done in the area without prior approval of the Central Valley Flood Protection Board.

**FOURTEEN:** The permittee is responsible for all liability associated with all construction, operation, maintenance and reclamation activities associated with the herein permitted project and shall defend, indemnify, and hold the Central Valley Flood Protection Board and the State of California; including its agencies, departments, boards, commissions, and their respective officers, agents, employees, successors and assignees (collectively, the "State"), safe and harmless, of and from all claims and damages arising from the project undertaken pursuant to this permit, all to the extent allowed by law. The State expressly reserves the right to supplement or take over its defense, in its sole discretion.

**FIFTEEN:** The permittee shall contact the Department of Water Resources by telephone, (916) 574-0609, and submit the enclosed postcard to schedule a preconstruction conference. Failure to do so at least 10 working days prior to start of work may result in delay of the project.

**SIXTEEN:** No construction work of any kind shall be done during the flood season from November 1st to April 15th without prior written approval of the Central Valley Flood Protection Board.

**SEVENTEEN:** Cleared trees or brush shall be completely burned or removed from the floodway, and downed trees or brush shall not remain in the floodway during the flood season from November 1st to April 15th.

**EIGHTEEN:** No construction equipment and/or material(s) shall remain in the Sacramento River flood control project works during the flood season from November 1st to April 15th.

NINETEEN: At all times during construction the levee crown roadway shall be kept clear for vehicular access.

TWENTY: All debris generated by this project shall be properly disposed of outside the Sacramento River flood control project works.

TWENTY-ONE: The work area shall be restored to the condition that existed prior to start of work.

TWENTY-TWO: In the event existing rock revetment on the levee slope is disturbed or displaced during construction, it shall be restored to its preconstruction condition.

TWENTY-THREE: Debris that may accumulate on the herein permitted encroachment(s) and related facilities shall be cleared off and properly disposed of outside the flood control project works after each period of high water.

TWENTY-FOUR: In the event that levee or bank erosion injurious to the adopted plan of flood control occurs at or adjacent to the herein permitted encroachment(s), the permittee shall repair the eroded area and propose measures, to be approved by the Central Valley Flood Protection Board, to prevent further erosion.

TWENTY-FIVE: The permitted encroachment(s) shall not interfere with operation and maintenance of the flood control project. If the permitted encroachment(s) are determined by any agency responsible for operation or maintenance of the flood control project to interfere, the permittee shall be required, at permittee's cost and expense, to modify or remove the permitted encroachment(s) under direction of the Central Valley Flood Protection Board or Department of Water Resources. If the permittee does not comply, the Central Valley Flood Protection Board may modify or remove the encroachment(s) at the permittee's expense.

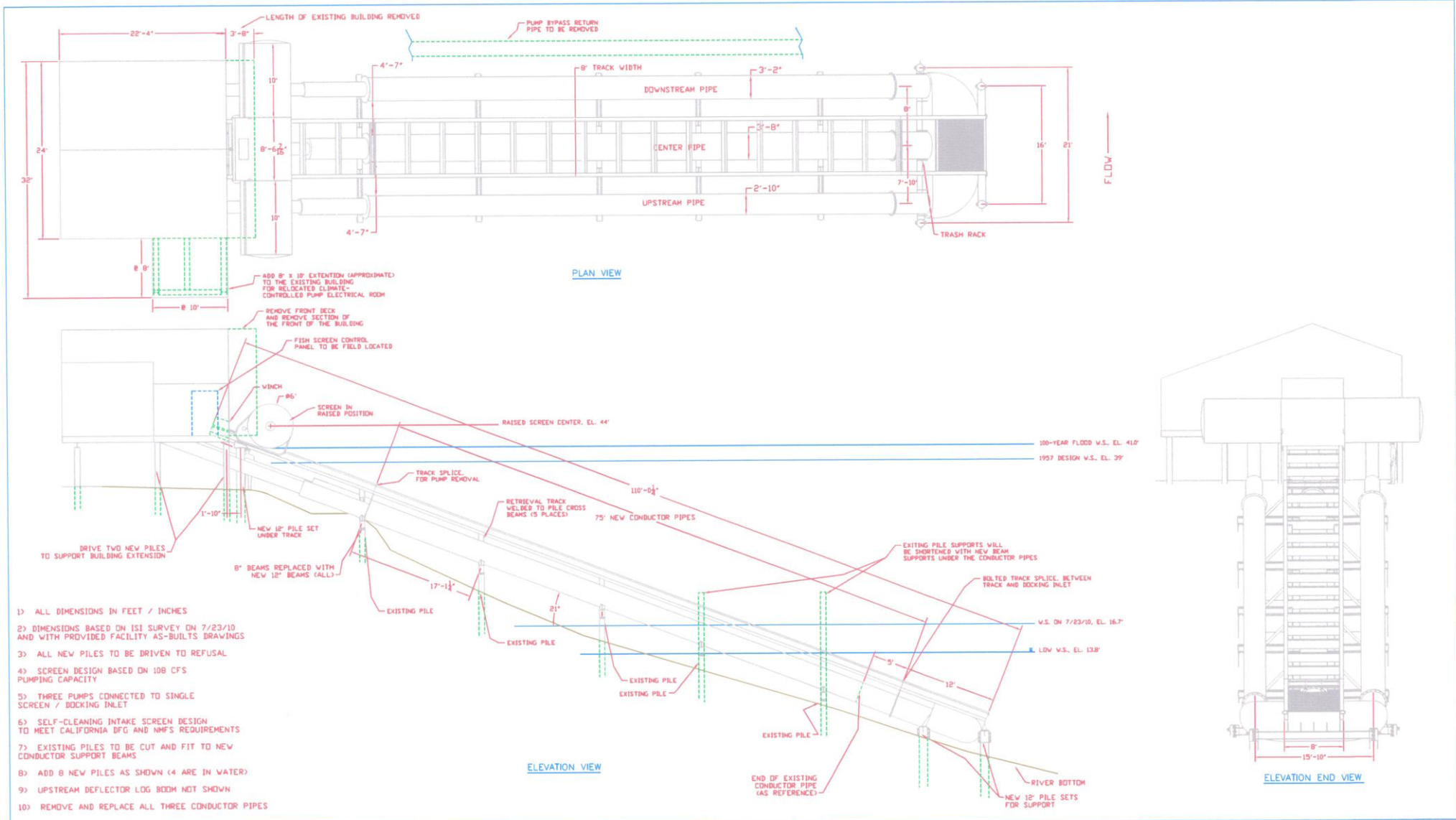
TWENTY-SIX: The Central Valley Flood Protection Board, Department of Water Resources, and Reclamation District No. 1500 shall not be held liable for damage(s) to the herein permitted encroachment(s) resulting from releases of water from reservoirs, flood fight, operation, maintenance, inspection, or emergency repair.

TWENTY-SEVEN: The permittee may be required, at permittee's cost and expense, to remove, alter, relocate, or reconstruct all or any part of the permitted encroachment(s) if removal, alteration, relocation, or reconstruction is necessary as part of or in conjunction with any present or future flood control plan or project or if damaged by any cause. If the permittee does not comply, the Central Valley Flood Protection Board may remove the encroachment(s) at the permittee's expense.

TWENTY-EIGHT: If the project, or any portion thereof, is to be abandoned in the future, the permittee or successor shall abandon the project under direction of the Central Valley Flood Protection Board and Department of Water Resources, at the permittee's or successor's cost and expense.

TWENTY-NINE: The permittee shall comply with all conditions set forth in the letter from the Department of the Army dated XXXX XX, 2011, which is attached to this permit as Exhibit A and is incorporated by reference.

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- 1) ALL DIMENSIONS IN FEET / INCHES
- 2) DIMENSIONS BASED ON ISI SURVEY ON 7/23/10 AND WITH PROVIDED FACILITY AS-BUILTS DRAWINGS
- 3) ALL NEW PILES TO BE DRIVEN TO REFUSAL
- 4) SCREEN DESIGN BASED ON 108 CFS PUMPING CAPACITY
- 5) THREE PUMPS CONNECTED TO SINGLE SCREEN / DOCKING INLET
- 6) SELF-CLEANING INTAKE SCREEN DESIGN TO MEET CALIFORNIA DFG AND NMP'S REQUIREMENTS
- 7) EXISTING PILES TO BE CUT AND FIT TO NEW CONDUCTOR SUPPORT BEAMS
- 8) ADD 8 NEW PILES AS SHOWN (4 ARE IN WATER)
- 9) UPSTREAM DEFLECTOR LOG BOOM NOT SHOWN
- 10) REMOVE AND REPLACE ALL THREE CONDUCTOR PILES

ALL DIMENSIONS IN INCHES UNLESS NOTED			
REV #	DESCRIPTION	DATE	INITIAL

www.intakescreensinc.com  
CA C.L. 796197

6417 River Road - Sacramento, California 95832  
(916) 665-2727 (916) 665-2729 FAX

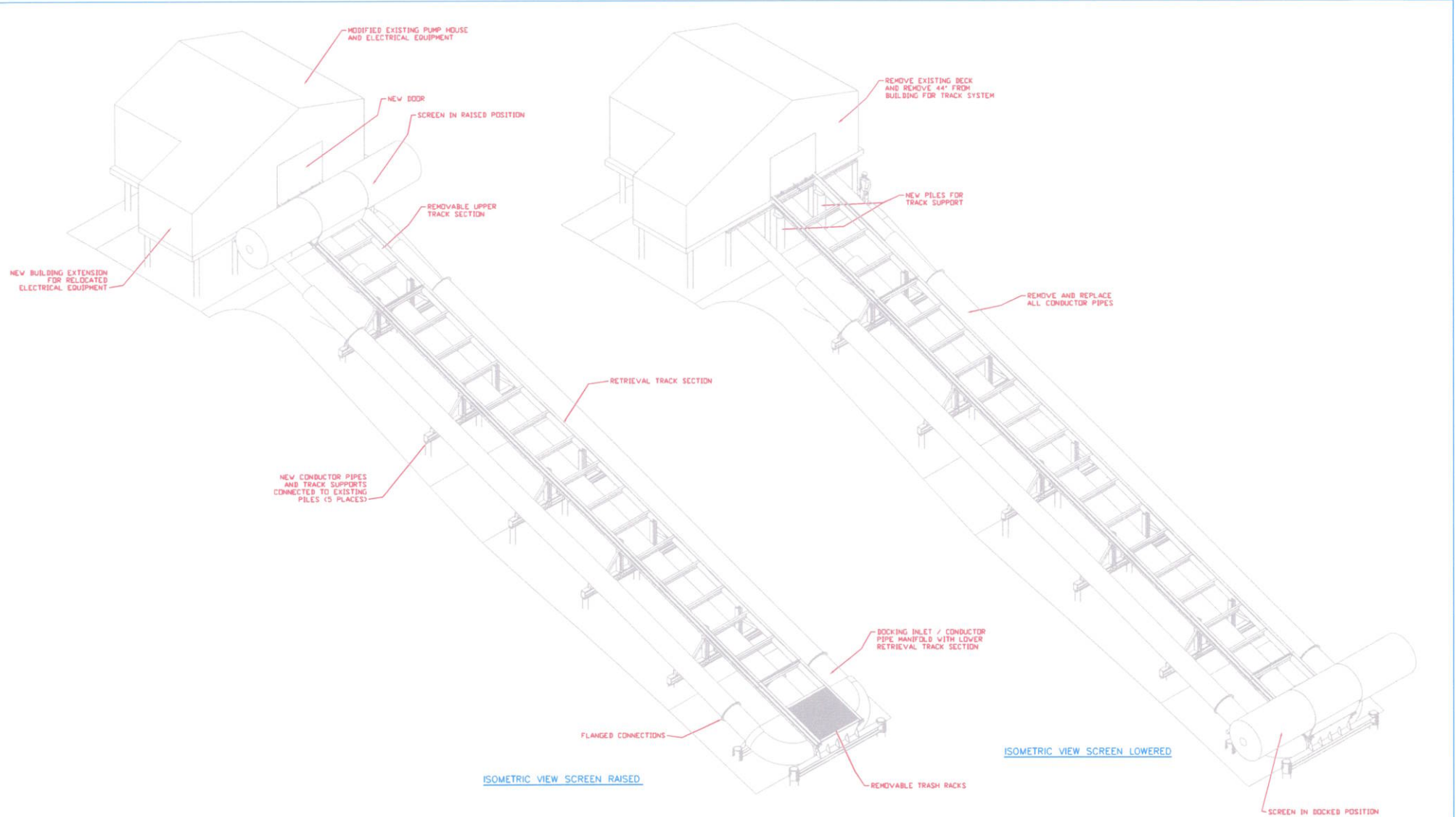
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APP'D BY	DARRYL HAYES
DRAWN BY	JACOB CHAPIN
"B" SHEET SCALE	1:120

PROJECT: PORTUGUESE BEND

DESCRIPTION: PORTUGUESE BEND LAYOUT - RAISED  
MATERIAL: 304 SS SCREEN / A36 STEEL TRACK

DRAWING NUMBER: PORTUGUESE BEND

SHEET NUMBER: PB-01



ALL DIMENSIONS IN INCHES UNLESS NOTED			
REV #	DESCRIPTION	DATE	INITIAL

www.intakescreensinc.com  
 CACL 790197  
**ISI Intake Screens, Inc.**  
 8417 River Road - Sacramento, California 95842  
 (916) 665-2727 (916) 665-2729 FAX

DATE	1/31/11
APP'D BY	DARRYL HAYES
DRAWN BY	JACOB CHAPIN
"B" SHEET SCALE	1:120

PROJECT:	PORTUGUESE BEND
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DESCRIPTION:	PORTUGUESE BEND LAYOUT
MATERIAL:	304 SS SCREEN / A36 STEEL TRACK

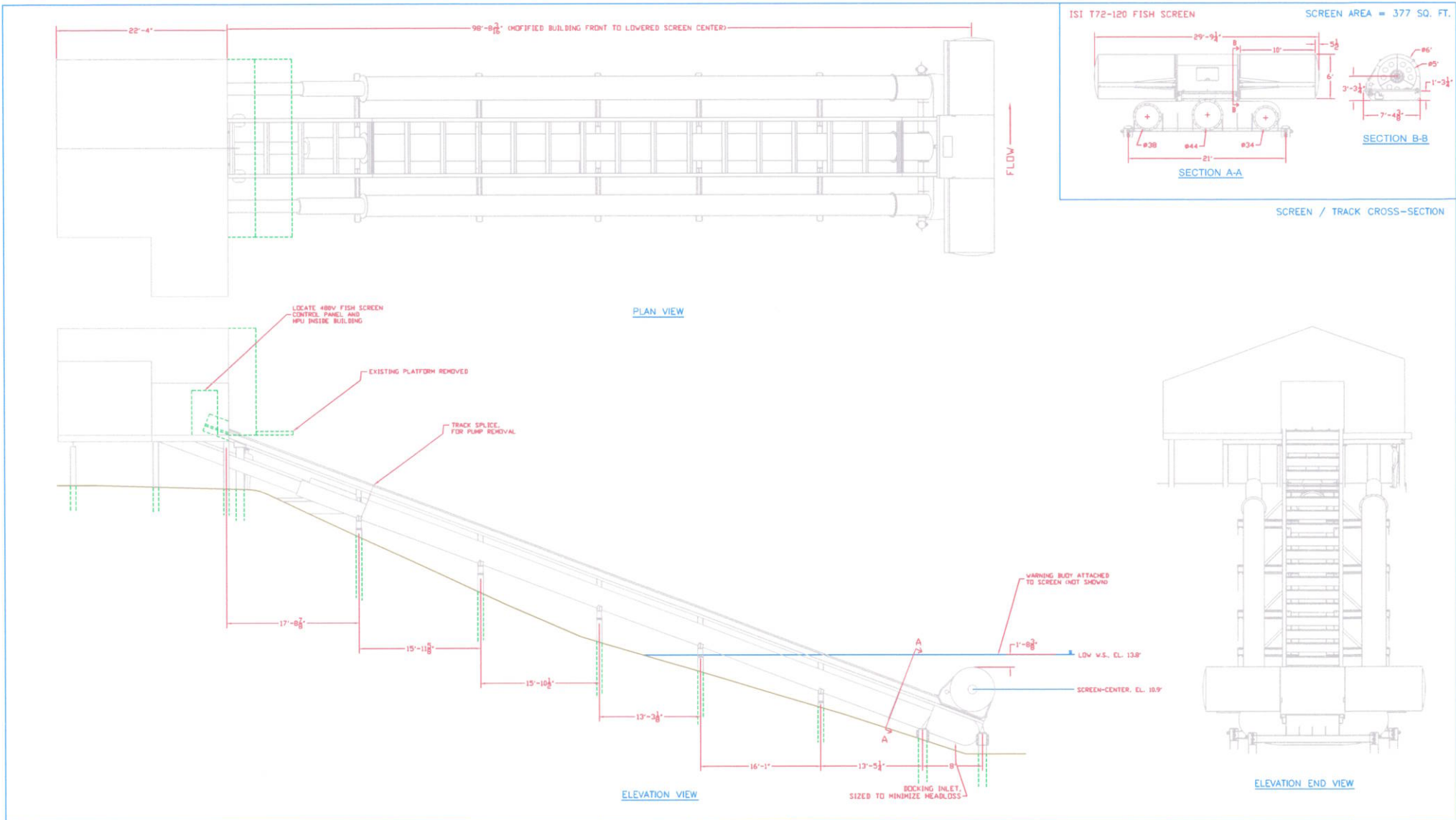
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SHEET NUMBER	PB-02
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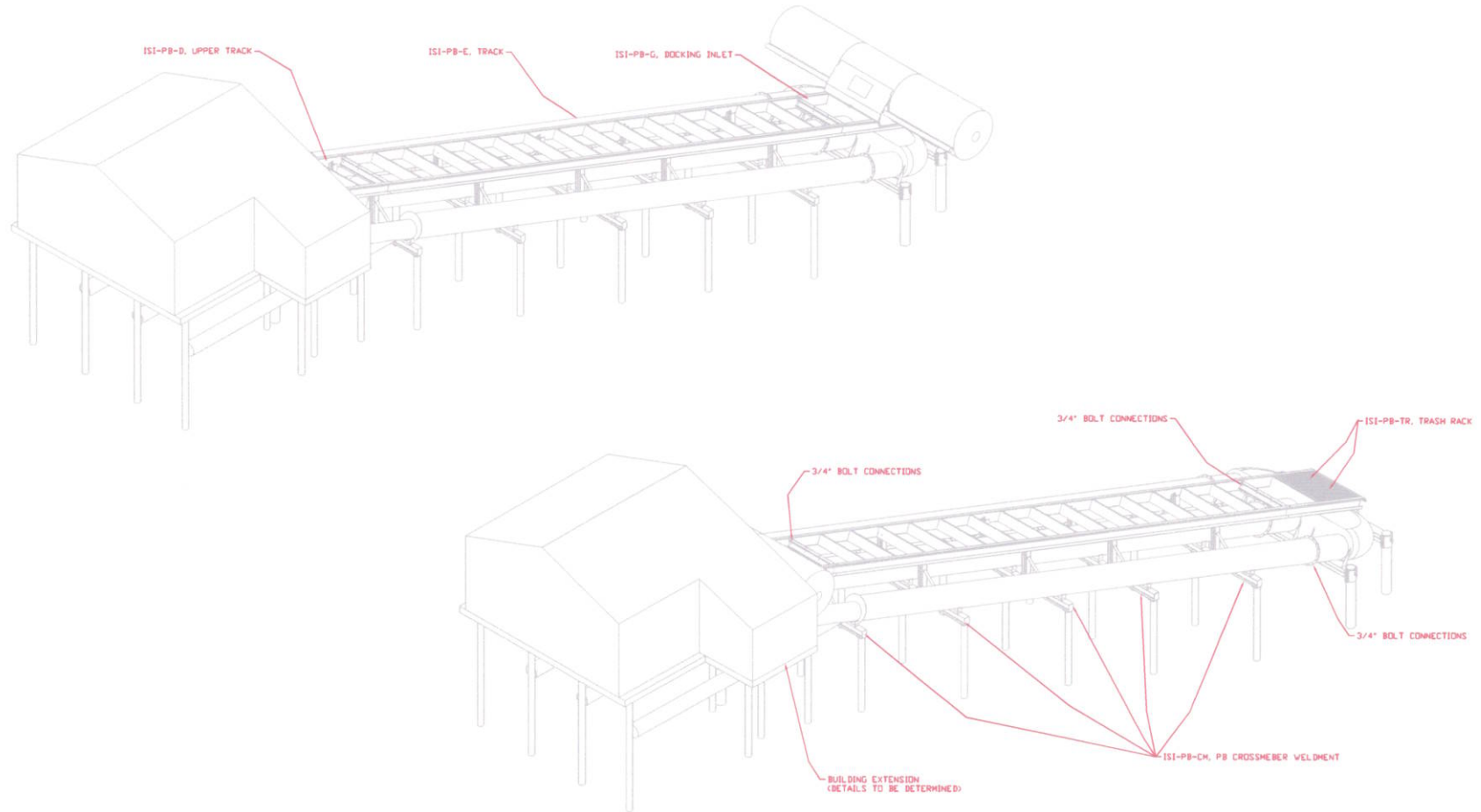
Designs are property of INTAKE SCREENS INC; and are subject to change without notice.

STANDARD TOLERANCES  
 Fractional Dimensions # 1/32  
 Decimal Dimensions # .005





ALL DIMENSIONS IN INCHES UNLESS NOTED				<p>www.intakescreensinc.com CA CL 796197 Intake Screens, Inc. 841 River Road - Sacramento, California 95812 (916) 665-2727 (916) 665-2729 FAX</p>	DATE 1/31/11	PROJECT: PORTUGUESE BEND	DESCRIPTION: PORTUGUESE BEND LAYOUT - LOWERED	DRAWING NUMBER: PORTUGUESE BEND	SHEET NUMBER: PB-03
REV #	DESCRIPTION	DATE	INITIAL		APP'D BY DARRYL HAYES DRAWN BY JACOB CHAPIN "B" SHEET SCALE 1:120	MATERIAL: 304 SS SCREEN / A36 STEEL TRACK			
<small>Designs are property of INTAKE SCREENS INC. and are subject to change without notice.</small>				<small>STANDARD TOLERANCES Fractional Dimensions = 1/32 Decimal Dimensions = .005</small>					



ALL DIMENSIONS IN INCHES UNLESS NOTED			
REV #	DESCRIPTION	DATE	INITIAL
Designs are property of INTAKE SCREENS INC; and are subject to change without notice.		STANDARD TOLERANCES Fractional Dimensions ± 1/32 Decimal Dimensions ± .005	

www.intakescreensinc.com  
CA C.L. 796197

Intake Screens, Inc.  
8417 River Road - Sacramento, California 95832  
(916) 665-3727 (916) 665-3729 FAX

DATE	1/31/11
APP'D BY	DARRYL HAYES
DRAWN BY	JACOB CHAPIN
"B" SHEET SCALE	1:120

PROJECT:	PORTUGUESE BEND
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DESCRIPTION:	PORTUGUESE BEND LAYOUT
MATERIAL:	304 SS SCREEN / A36 STEEL TRACK

DRAWING NUMBER:	PORTUGUESE BEND
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SHEET NUMBER	PB-04
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*Water Resources • Flood Control • Water Rights*

## TECHNICAL MEMORANDUM

**DATE:** June 20, 2011

**TO:** Family Water Alliance  
c/o Debbie Lemburg

**SUBJECT:** Hydraulic Impact Analysis of Sutter Mutual Company Portuguese Bend Pumping Plant Fish Screening System Encroachment

**Prepared by:** Patrick Ho, P.E.

**Reviewed by:** Don Trieu, P.E.



The Sutter Mutual Water Company's Portuguese Bend Pumping Plant and the proposed fish screening system (project) are located on the left bank of the Sacramento River at approximately USGS River Mile 88.2, as shown in relationship to the Sacramento River Flood Control System on Figure 1. The fish screening systems are located on the waterside of the Sacramento River levee, as shown in Figure 2. The purpose of this analysis is to determine the potential hydraulic impacts of the proposed fish screening system's encroachment, as detailed on Figure 3.

### Hydraulic model

The Sacramento River HEC-RAS model release 2 (Model) was used for this analysis. The Model was originally developed by the United States Army Corps of Engineers (USACE) and calibrated by MBK Engineers to the January 1997 flood event. The calibration targeted system-wide observed flows and water marks for the January 1997 flood event. The calibration is documented in the "USACE Sacramento River Basin HEC-RAS Model Calibration Refinement

for West Sacramento Analyses.” For the project site’s particular reach of the Sacramento River, the calibrated Model is found adequate for this impact analysis. The extents of the hydraulic model are shown in Figure 4.

The SRFCP design discharge in this particular reach of the Sacramento River is 30,000 cfs. An existing hydraulic model simulation with a Sacramento River peak discharge of 29,200 cfs was simulated for the Base Condition and the Project Condition.

### **Encroachment Modeling Approach**

The Sutter Mutual Water Company’s Portuguese Bend Pumping Plant is located at USGS River Mile 88.2 on the Sacramento River. The corresponding Model’s River Mile is 88.69. Prior to modifying the Model to project specific geometry, the nearest hydraulic model’s cross-section to the project site is located at River Mile 88.75 (see Figure 2). Cross-sections 88.70, 88.69, and 88.68 were added in the model between cross section 88.75 and 88.5 to represent the location of the fish screening system encroachments. The impact of the Portuguese Bend Pumping Plant fish screening system was then estimated by adding an obstruction to the left bank of cross-section 88.69, as shown in Figure 5.

Per the design drawing (Figure 3), the proposed fish screen system consists of new conductor pipes, tracks, and new piles with an approximate length of 110 feet. However, because of the angle of the conductor pipes, the actual encroachment in the cross-sectional’s stationing is approximately only 96 feet along the left bank of cross-section 88.69. To simplify the modeling approach, the screening system was conservatively modeled by applying a blocked obstruction to the entire left bank for a width of approximately 105 feet measured from the left bank station. The selected length of blocked obstruction (105 feet) is focused on capturing the “blocked” elevation below the bottom of the existing conductor pipes.

Additional level of conservatism is present on this approach due to a wider range of elevations blocked. Specifically, the blocked obstruction blocks conveyance up to top-of-levee elevation at 44.77 feet, where the actual fish screening system encroaches only approximately 10 feet above and along the river’s bed and side slopes. Figure 5 illustrates the actual encroachment versus the modeled encroachment.


### **Results**

The results of the calculated water surface elevations are tabulated in the following table:

Water Surface Elevation (WSE) Comparison

River Mile	Base Condition (WSE, ft)	Project Conditions (WSE, ft)	$\Delta$ WSE (ft)
88.75	40	40	0.00
88.70	39.99	39.99	0.00
88.69 <sup>1</sup>	39.99	39.89	-0.10
88.68	39.99	39.99	0.00
88.50	40.01	40.01	0.00
<sup>1</sup> Location of fish screen encroachment			

Using the Base Condition's peak discharge, the analysis shows no change in maximum computed water surface outside of the range of 0.1 feet for the cross-section of the proposed fish screening system. Therefore, it can be concluded that the Sutter Mutual Water Company's Portuguese Bend Pumping Plant fish screening system has no measureable impact on the SRFCP design flood plane.



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Patrick Ho, P.E.

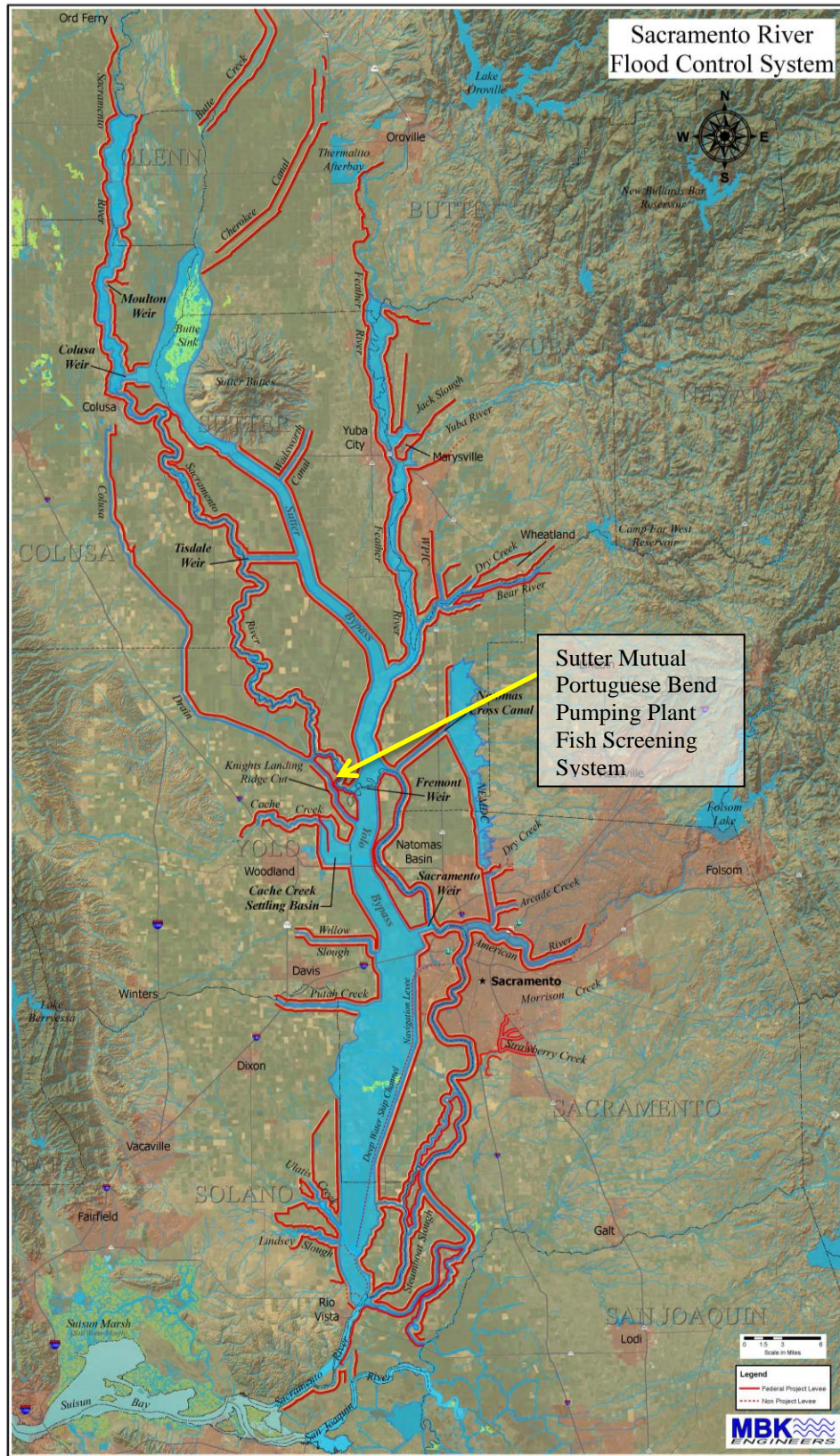


Figure 1. Location Map

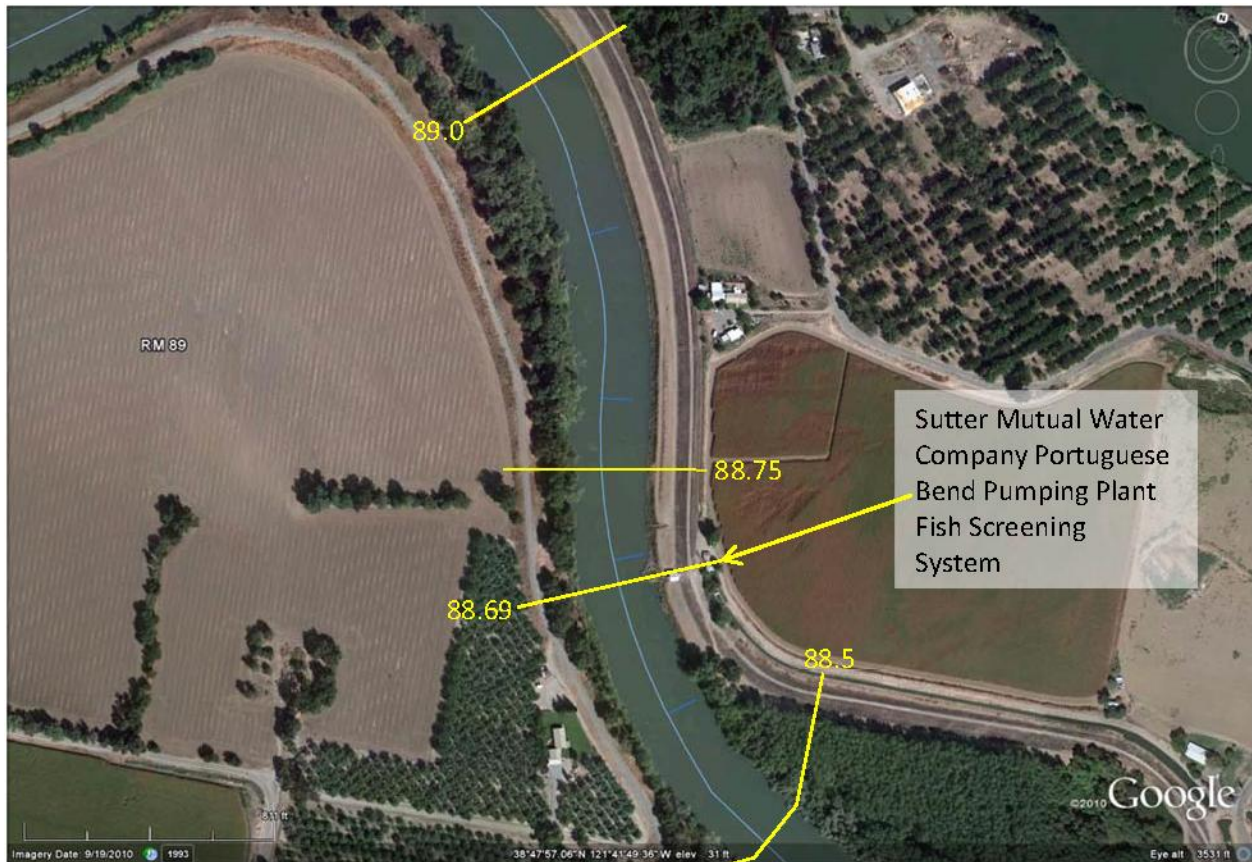


Figure 2. Site Map





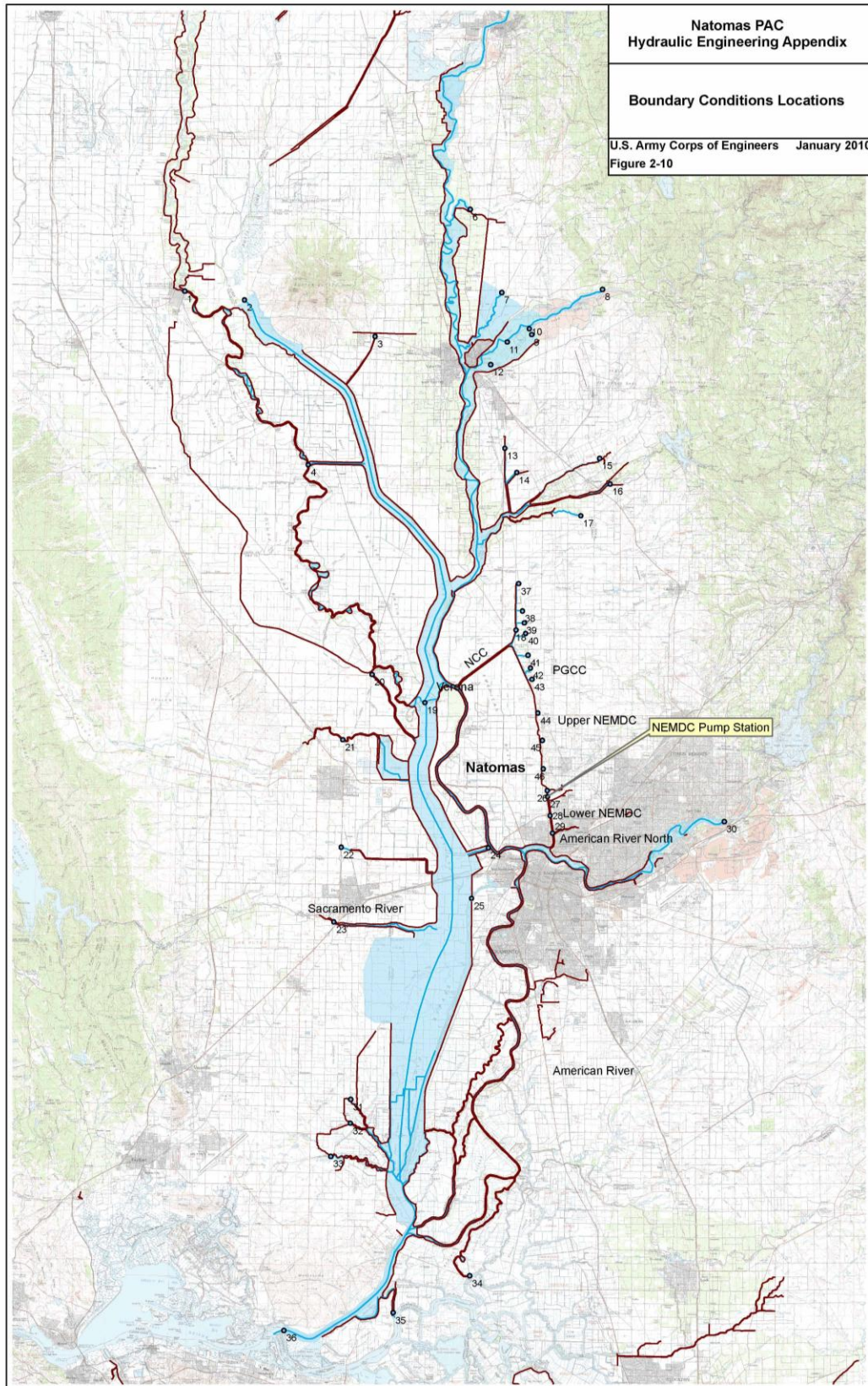


Figure 4. Hydraulic Model Extents

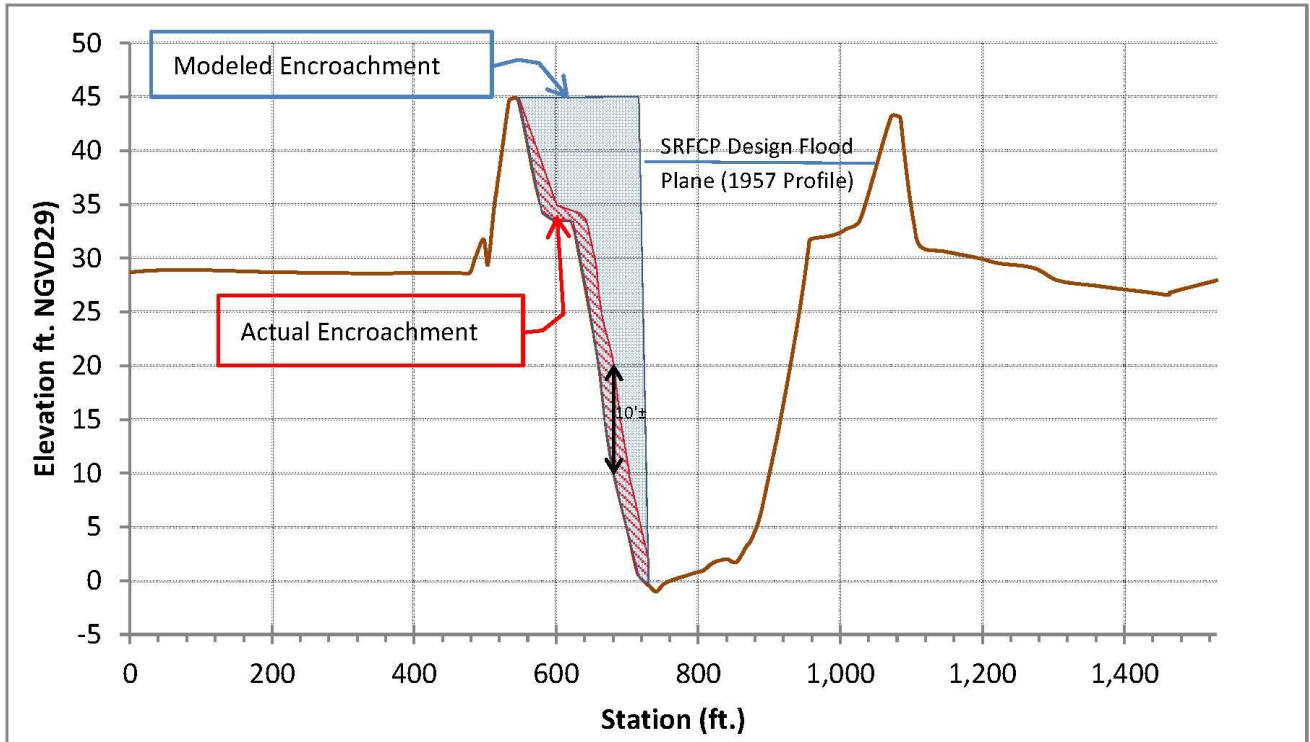


Figure 5. Cross-section 88.69

**APPLICATION FOR A CENTRAL VALLEY FLOOD PROTECTION BOARD  
ENCROACHMENT PERMIT**

Application No. \_\_\_\_\_  
(For Office Use Only)

1. Description of proposed work:

This project will encompass the installation of a state-of-the-art, self-cleaning, retractable Intake Screens, Inc. fish screen system on an existing agricultural diversion owned and operated by Sutter Mutual Water Company. The identifying for this site is Project No. Y02-01 Sutter Mutual Water Company Portuguese Bend Pumping Plant. This diversion is located on the east bank of the Sacramento River at approximate river mile 88.2. The tentative date of installation is September through November 2011.

2. Location: Sutter County, in Section 13,

Township: 11 N (N) (S), Range 2 E (W), M. D. B. & M.

3. Sutter Mutual Water Company of P.O. Box 128  
Name of Applicant Address

Robbins CA 95676 530-738-4423  
City State Zip Code Telephone Number  
530-738-4327  
Fax Number

4. Endorsement: (of Reclamation District)

We, the Trustees of \_\_\_\_\_ Reclamation District No. 1500  
Name and District Number

approve this plan, subject to the following conditions:

- Conditions listed on back of this form  Conditions Attached  No Conditions

Mark Richter 1/25/11 Frank Alina 1/25/11  
Trustee Date Trustee Date  
Scott G. Buckle 1/25/11 George Van Pelt 1/25/11  
[Signature] 1-25-11

5. Names and addresses of adjacent property owners sharing a common boundary with the land upon which the contents of this application apply. If additional space is required, list names and addresses on back of the application form or an attached sheet.

Henry Richter 22474 Karnak Road, Knights Landing, CA 95645  
Name Address Zip Code

Lee Richter 22474 Karnak Road, Knights Landing, CA 95645

Emile & Simone Furlan 22122 Karnak Road, Knights Landing, CA 95645